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The invention relates to an insulating material course from mineral fiber felt in accordance with the preamble of the claim 1.

Vor allem bei der Dämmung zwischen Dachsparren mit Mineralfasermaterial besteht eine wesentliche Schwierigkeit darin, dass das bahn- bzw. plate shaped prefabricated mineral fiber material with certain width dimensions manufactured and for the order provided must, the distances of the rafters will be able in particular however anyhow to vary from construction site to construction site, frequent and with old buildings in addition, from Sparrenfeld to Sparrenfeld and even within a Sparrenfeldes. The mineral fiber material must become thereby with a predetermined pressing between the rafters incorporated, which are on the one hand large enough, in order to avoid as well as obtain around a bias any gaping at the edges to the prevention of cold bridges and from convection to, and on the other hand however so large to be it may not that upbulging the material arise; these could close and defeat the backing ventilation gap unintentionally the desired formation of a planar inner surface of the insulation. Depending upon compressibility of the mineral fiber material therefore the excess should become with the incorporation in the area between and five centimeters an held.

The insulating material courses or - plates can become generally only in certain nominal widths of for example 500, 600, 700, 800 and 1000 mm made and delivered. The width between the supports, about roof rafters, exhibits however intermediate values. For instance with a rafter distance of 600 mm a web or a plate with a nominal width of 600 mm would possess no sufficient excess more, and would have therefore to the nominal width of 700 mm to be fallen back. This nominal width would result in however again an excess of 100 mm, thus the double of that excess, which bottom favorable prerequisites straight still allowable is.

Therefore cutting work or similar measures of adaption is essential on the construction site, if not to a still many finer Abstaffelung of the nominal width one falls back, which would have to lead however to a whole significant raising the price of of the manufacture and in particular the supply attitude. Such measures of adaption are labor intensive and lead inevitably to blend.

It was not missing therefore in the past at experiments to facilitate such adjustments to the respective rafter-wide and/or to minimize the blend resulting thereby.

So it is for instance from that THAT 78 30 852 known, plate shaped insulating material elements for the insulation between roof rafters at their outside longitudinal sides provided with rib-formed incisions to, in order to produce on the one hand target break being for a rapid defined reduction of the slab width and to increase on the other hand the compressibility of the insulating material plate local in the edge region, so that the plates bottom avoidance of cold bridges solid between the rafters pressed to become to be able. Unfavorable is here that relatively spread the multiplicity that, nutenförmigen cuts Wärmedämmfähigkeit insulating material situation in this boundary regions inevitably lowers, which will be away-broken the more strongly perceptibly, the less the lateral insulating material ribs for the respective case of installation must; for the case of a as standard equipment appropriate width of the insulating material situation all nutenförmigen incisions obtained remain setting and the capacity of thermal insulation in the edge regions of the insulating material situation corresponding strong down. Further the insulating material ribs between the incisions, since they are only connected with one another over a thin bar of the warm barrier in the reason of the incisions, can be torn off also inadvertently damaged or stopped or. Finally the nutenförmigen incisions must become obvious by corresponding sawing and milling tools into the insulating material situation of introduced, thus by an waste-intensive processing, which already leads with the treatment to relative high wastes. On the building site further wastes result by the fact that the broken off or torn off edge strips in all rule cannot be used meaningfully.

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To the avoidance again these disadvantages is it from the DE-OS 31 18 597 known to manufacture the lateral edge regions with already in trains of the production the full edge strip of the insulating material situation separated of the central region which is fixed by sticking at a lamination, then continued in the edge region. In order to avoid a gaping of the lateral, cut off edge strips, the sections become in trains of the production of the insulating material course before the lamination again completely closed, so that achieved at the edges of cut a bias becomes by lining buntings and claws and if necessary also by the consistency of the bonding agent in the insulating material situation the time of the closure of the section. By corresponding bending of the lamination at the desired section however gaping can become selective generated by hand at any time and become the so angled edge strip bottom overcoming of the holding force of the adhesive bond of cover us the withdrawn. Thereby achieved becomes that due to the mutual plant of the cut surfaces neither in the appearance nor in the Wärmedämmfähigkeit of such a insulating material course differences to an insulating material course without any incisions are present, since the incisions are to a large extent more invisible and do not step functional into appearance. However a gaping of the sections at locations can occur with inappropriate handling quite, at which no separation is to take place. Such a gaping section makes however the proper incorporation more difficult. Will, in order to limit the excess and thus the edge dipping as good as possible to the desired value, several incisions in each edge region of the insulating material situation of introduced, then the width of the edge strips between the single incisions relative small precipitates. Also those can cause relative small edge dipping with the proper incorporation that the adjacent

incisions are inclined to gaping and deform so the stopped lateral edge strip unintentionally.

Finally the risk of a damage of the lamination and thus an impairment of the vapor barrier achieved by the lamination exist when removing the edge strip which can be removed from the glued lamination with inappropriate handling. In particular unchanged high wastes result with unfavourable installation conditions, since any arising over-wide of the insulating material situation must become always remote.

From the DE-OS 32 29 601 an insulating material course is known, which a proper incorporation of untrained forces possible and nevertheless the adaptation to the respective rafter-wide substantial facilitated. Since this insulating material course exhibits functional disadvantages in relation to an insulating material course fitting as standard equipment neither with the installation nor in the effect, it could become generally accepted as only the described suggestions in practice to the broad extent. The ease of the adaptation consists of the fact that in the lateral edge regions of the insulating material situation only optical effective, coloured set off are, the insulating material situation actually not weakening marking lines provided, which modular edge strip defines, which in trains of the adaptation to the respective rafter-wide cut to become to be able. The user needs to thus only select, at which marking lines a section is to take place, inserts then a gumption assistance between the insulating material situation and the lamination and can immediately subsequent without other aids such as rulers or such a thing the section along the predetermined marking line into trains accomplish, whereby it must pay attention exclusive still to the fact that it follows the course of the marking line with the knife. Unfavorable it is however here still that from cutting to the desired rafter width inevitably the same blend results as with the suggestions described so far.

From the DE-OS 32 29 601 an insulating material course made of mineral fiber felt is known, which is roll upable to a roller and exhibits optical marking lines, which give an assistance for the cutting of the edge strips to the insulating material course, in order to adapt these for the incorporation in Sparrenfeldern, whose rafter distance is a small as the nominal width of the insulating material course. In such a manner the insulating material course cut to the width of the appropriate Sparrenfeldes then as course in the usual way between the rafters one brings in, as the top margin of the insulating material course at an end of the Sparrenfeldes is specified and brought in then the rolled up course between the rafters. Apart from the fact that the cutting of prolonged edge strips of an insulating material course an expensive Prozedere represents, it arises as a result of cutting to the desired rafter-wide inevitably a corresponding blend of the insulating material course, which is not irrelevant depending upon roof-large. In particular with the insulation of old buildings, with which the distances of the rafters from Sparrenfeld can vary to Sparrenfeld, in particular however also within a Sparrenfeldes significant, the known insulating material course presupposes anyhow a previous Entrollen of the web on the length of the Sparrenfeldes and cutting through the insulating material course over the entire rafter field length bottom consideration of the varying rafter distances, which however expensive is, in addition, with inaccurate or incorrect measuring of the rafter distances over the length of the Sparrenfeldes to a corresponding committee and/or. Verschnitt der Dämmstoffbahn führen kann.

To the avoidance of blend it is for instance formed from like that the DE-OS 32 03 624 also known to go off a rectangular plate or course form and instead of its for example after type of a triangle to use wedge shaped insulating material plates. These wedge shaped plates are to become wedge-free with undersize the order provided and single as well as on the basis a second, reverse introduced plate in such a manner keyed introduced between the rafters there that desired pressing results. Such wedging plates in the Sparrenfeld encounters in case of of mineral liber material however already practical difficulties, because the spreading wedge effect which can be obtained with such a disk's pair presupposes a sliding of the plates along the lying close slants, which permits however the consistency extent most limited by mineral wool if necessary to. Far hit results, if perpendicularly to the longitudinal extending of the Sparrenfeldes the lying side of the dreieckförmigen plate corresponds not coincidentally to the rafter distance, the further difficulty that a laterally supernatant point of an insulating material wedge at the ratter and one must be squeezed upward over standing point at the following surface area of a plate. This leads to local accumulations of material, which disturb and inevitably in the group to gaping between neighbouring disk edges lead the mutual plant of the disk elements, which entail again cooling bridges and convection.

Therefore such a blend-free transfer of such triangular plates is not in the practice possible. Like a folder ?Rocky - isolating program? of the firm German Rockwool Mineralwoll GmbH in Gladbeck illustrated, consists the single practical proceeding with the incorporation of such wedge shaped plates made of mineral fiber material of making the plate available in a large width which exceeds in any case rafter distance, and then to far supernatant corner each plate to cut off, so that a trapezoidal shape with a width results, which to the rafter distance plus the excess for the achievement of pressing corresponds. This plate can become then single there pressed between the rafters introduced and as well as on adjacent, already introduced plate pushed over and there applied.

The work expended for the adjustment to the rafter width is however not decreased thereby, but is not increased in relation to the suggestions described before; because the rafter distance measured before must be offered and be implemented then an appropriate cut at each individual plate, while this expenditure is necessary per Sparrenfeld with longer mineral fiber courses only once. In order therefore in accordance with the folder mentioned proposed will decrease, this effort something to together-add in each case two wedge shaped plates in the later installation position in pairs in such a manner that the width out of the two plates needs to become formed, approximate rectangular mounting unit only once by mutual displacement adjusted, and subsequent into trains the supernatant corners of both triangular plates cut to become to be able. In the case of for example ten triangular plates shifted in a Sparrenfeld this however still right significant labor results in in the form of live measure attitudes and ten sections, even if for the case of an installation by only a person the work becomes facilitated by the fact that the small plates light as prolonged webs of a single person manipulated to become to be able. Further the corresponding respective length of the Sparrenfeldes and the formation of its end regions result additional effort for cutting finallateral plates.

Even if thus the labor by cutting and the manipulation of a relative large number relative small plates is higher, then the cut losses decrease however nevertheless opposite a simple cutting of a lateral projection over the whole length of the Sparrenfeldes. A minimization of the cut losses presupposes however also here that wedges with different widths become the order provided, since the cut losses natural again strong increase if a triangular plate laid out for maximum rafter distance must become so strong cut that it fits for minimum rafter distance. Therefore can become also with such methods

inevitable cut losses only then an actual significant small held, if an unchanged plurality from nominal widths becomes to the order provided.

Beside that relative labor intensive transfer and anyhow the significant blend nevertheless right with the production in only one nominal width consists an other major drawback of this method of the fact that the wedge shaped mineral fiber plates in disk packs packaged and supplied to become to have, and rolled to become not be able. In roll form stored and supplied mineral fiber webs have in contrast to this the advantage of a significant reduced transport and stockroom, there the mineral fiber material in the roller strong compressed are and due to the pressure effect in the roll form also without local, irreversible squeezings compressed will can. With such mass products a reduction of transport and camp volume brings very noticeable cost advantages to small bulk density for example on the half also regarding the corresponding saving of packaging material.

The folder OCF ?FRICTION FIT ONES BUILDING INSULATION? the Owens Corning fiber glass of corporation, Toledo/Ohio, the USA, 1973, in particular Fig. , the arrangement of differently cut pieces of insulating material of secondary/or shows 2 and-suppl.-lines up for filling out fields between vertical stands. Thus becomes however only section-wise building up of pieces of insulating material in transversal direction or one above the other predetermined, which represents a troublesome venture however for filling out Sparrenfeldern with varying width by corresponding cuts. This leads also to an excessive materials consumption by blend, since the here used insulating material in the form of so called is present batts, D. h., these consist folded insulating material strip before the incorporation of before-lengthened and for the transport of mineral wool with lengths of 1,15 m or 2,30 M.

Object of the invention is it to facilitate the incorporation of mineral fiber material into a Sparrenfeld between roof rafters to purposes of the roof insulation to make in particular a simple one-man incorporation possible without substantially increased labor and to minimize or completely avoid the blend resulting with the incorporation. At the same time is to be able to be done without a production and a supply attitude of mineral fiber material in different nominal widths.

This task is solved according to invention by the characteristics contained in the characteristic part of the requirement 1.

The invention is characterised by the fact that a roll upable insulating material course becomes made of mineral fiber felt special conditioned by the fact that the web becomes as such transverse to its longitudinal extent by known modular marking lines divided, so that in stretched condition of the insulating material course quasi-insulating material plates in line result, which purposes of the introduction into the Sparrenfeld in desired manner only more by cutting through in the area of the marks separated to become to have. Thus it results into the advantages of the conventional insulating material course and from conventional insulating material plates as insulating material course and insulating material plates are practical such combined to a product that the insulating material course rolled up to purposes of the transport and the storage to a roller can become locally insulating material plates by cutting through the web in the area of the marks converted and the plates become then pressed transverse to the longitudinal extent of the insulating material course between the rafters of a Sparrenfeldes.

As a result of the measures according to invention astonishing advantages arise, since once substantially place is saved with transport and storage of the barrier opposite individual insulating material plates. On the other hand locally the blend is minimized and/or when shifting. to a large extent eliminated, in particular also with Sparrenfeldern with strong divergent rafter distances, since the insulating material course becomes so used that those was away solid predetermined width of the insulating material course the length of the insulating material plate certain locally introduced between the rafters and thus by corresponding prolonged cutting of a piece insulating material course is corresponded.

Despite delivery of the mineral fiber material in only a single nominal width thus a significant reduction of the blend in the rule on zero results. Further can be worked in favorable way with material of the role and is substantially decreased the work expended for the installation by the substantially larger disk surfaces, although each plate can be handled nevertheless by an individual person without difficulty and despite its size to a certain extent custom-made between the rafters sits. The number of the parting lines between the plates, which are not actual desired of the principle of joint-free a filling out of the whole Sparrenfeldes as possible as possible in principle weak points, is more other significant reduced, since only some few transverse joints per Sparrenfeld arise, which due to their Planlage crosswise in the Sparrenfeld by pressing the plates reliable closed in slightly to become to be able.

Due to the large width of the provided insulating material roles with a length of 5 m and more and the avoidance of any blend on the average about two Sparrenfelder can be dammed with a role. From therefore it smaller meaning gets to the circumstance that the last remaining length section, which results in a too small slab width in all rule would have to be used only after appropriate cutting for other one installation, so that to small extent blend would result here. Because a too short end of the role can be completed by an initial at the beginning of the following role is avoided, however also at the role end any blend, since the missing width of a remaining length section at the end of a role can be completed by an accordingly narrow initial at the beginning of the following role and be formed in such a way from these two length sections a two-piece plate with the desired dimensions without each blend can. The only characteristic to a usual plate is a separation joint vertical in the Sparrenfeld, which arises for example in each second or third Sparrenfeld.

For practical reasons it turned out as favourable that the marking lines on the insulating material course in a distance from approx. 100 mm are intended. Als Schneidhilfe verwendbare Markierungslinien werdon in an sich bekannter Weise als optisch wirksame, farblich abgesetzte, die Dämmstoffbahn faktisch nicht schwächende Trennlinie verwendet.

With regard to a increased rigidity of the plates and a better bias when the pressing in of an insulating material plate between roof rafters, it is appropriate that the course a increased Bindemittelgehalt between approximately 6 and 7 Gew. -% of the dry bonding agent in the insulating material course exhibits.

Finally it is favourable that the insulating material course in wind in the relationship 1: 2,5 compressed it is whereby on the one hand place advantages for transport and storage of the rolled web and on the other hand a sufficient back spring action of the mineral fiber material given is, so that this reliable can up-fit itself with springs on its nominalthick.

In the following a preferential execution form of the invention is described on the basis the design. In it show

Fig. 1 in perspective representation a role from mineral fiber material with unrolled final section and

Fig. 2 an illustration of the installation of the mineral fiber plates between roof rafters, produced by separation of length sections of the mineral fiber course.

In Fig. 1 illustrated mineral fiber course 1, whose front final section 2 is unrolled represented, may be in the case of example a unkaschierte course with width of 1200 mm, a nominal thickness of 100 mm and a length of 6 m. With a gross density of for example 18 kg/m< 3> and a Bindemittelgehalt at phenolic resin of 6,6 Gew. - a material of the group of heat conductivities of 040 results % (drying).

It is pointed out that in Fig. 1 illustrated position of the mineral fiber web 1 with only partly unrolled front end section of 2 holding forces corresponding in the practice without application does not arise, since the internal stress is in the coil of the roller designated with 3 so large that with the removal of the envelope of the entire coils it comes up and the mineral fiber web 1 complete in stretched condition is present, as it is in the drawing for the front end section 2 illustrated. This not only because of the compression of the material in wind for example in the relationship 1: 2,5, sondern auch wegen der Rückfederkraft des Mineralfasermaterials an sich. As from Fig. 1 is evident, fits the mineral fiber material with springs with the landing run on its nominal thickness up. During the production of the mineral fiber course 1 in the production line becomes thereby with an oversize of the thickness of approx. 10 mm worked. After the compression of this material in the role during a longer period away it fits with springs then up to its nominal thickness of z. B. 100 mm up.

On in wind surface 4 of the mineral fiber course lying inside for marking lines 5 applied, perpendicularly to the lateral edges 6 of the mineral fiber course 1 and parallel to the front edge 7 of the mineral fiber course 1 ran. In the case of example the marking lines may be applied 5 in same distances, whereby the distance D between two neighbouring marking lines may amount to 100 mm. Wie Fig. 1 illustrated, the marking lines 5 need to be implemented not as continuous lines, but cannot lines also interrupted be. Substantially is however that the marking lines 5 are not formed by cuts or such a thing, but are only optically effective and the management and effectiveness of the material of the mineral fiber course 1 not noticeably affect.

Around a Sparrenfeld with from Fig. 2 evident width D of for example 700 mm to fill out, along the marking lines 5 with consideration of the oversize u necessary for pressing of for example 10 mm a length section L with a length is measured by 710 mm on the basis of the front edge 7 of the mineral fiber course 1 and cut off with 7 ". For this becomes in in Fig. 1 suggested way on the measured cut line a measurer 8 set and toward the arrow 9 parallel to the neighbouring marking line 5 by the material pulled.

Thereby an insulating material plate 10 is formed, like it from Fig. is evident to 2. The insulating material plate 10 is turned in such a way that the before lateral edges 6 of the mineral fiber course 1 come therefore to lie above and down and the length section L determines the width of the mineral fiber plate 10. In dieser Stellung wird die Mineralfaserplatte 10 in eines der mit 11 bezeichneten Sparrenfelder zwischen zwei benachbarte Dachsparren 12 eingesetzt. The oversize u of the length section L opposite the width D of the Sparrenfeldes 11 in the installation place of in the case of example 10 mm or little more results in desired pressing of the mineral fiber plate 10. After using between the rafters 12 the mineral fiber plate 10 holds thus by clamping effect.

The Sparrenfelder 11 front in the design, which are equipped already with mineral fiber plates 10, clarify that only few are necessary, in the case of example three mineral fiber plates 10 per Sparrenfeld 11, in order to dam this completely. First in each case the lowest mineral fiber plate 10 between the neighbouring roof rafters 12 is used and pressed and pushed - if necessary after previous slight cut of the lower edge of the mineral fiber plate 10 in accordance with the training of the lower end of the Sparrenfeldes 11 - downward. Then the next mineral fiber plate 10 over the already incorporated mineral fiber plate 10 set, between the rafters 12 is imprinted and downward on dense plant to the already incorporated mineral fiber plate 10 slid and pressed. In this way the complete insulation for a Sparrenfeld 11 develops with few handles. The dash-dotted suggested and transverse joint between adjacent mineral fiber plates 10, designated with 13, is not more recognizable with the eye from the removal practical. If the mineral fiber plates 10, how it illustrates with which marking lines 5 at the inside are inserted, is only recognizable that here a disalignment of the marking lines 5 arises. If necessary naturally however also the mineral fiber plates 10 with the marking lines 5 can be inserted in the direction of the roof exterior.

As from Fig. 2 apparent is, exhibits the upper insulating material plates 10 to the roofridge in installation position a smaller height than the underlying mineral fiber plates 10, in the case of example the half height. For this the prolonged section L, are 10 formed from which the upper mineral fiber plates, in the center parallel to the lateral edges 6 was again cut through, so that the cut parts of a single mineral fiber plate 10 full height were sufficient, in order to fill out two Sparrenfelder 11 up to the roofridge, without any blend would have resulted. Of course one would have the part in the second Sparrenfeld 11, no longer required in the first Sparrenfeld 11, also in the bottom area to set and from there from the insulation more other to construct be able, and it is clear apparent that such a division of a mineral fiber plate is 10 also problem-free possible for the conclusion in the roofridge range, if only a small or a very large piece of a full plate for the residual insulation within the roofridge range becomes required. Required one is only that an other Sparrenfeld 11 the same width is available somewhere, whereby bottom acceptance of a slight blend also an use of the remainder part of the cut off mineral fiber damming plate is 10 for a Sparrenfeld 11 with other width possible.

Similar one will remain at the end of the mineral fiber web 1 after the last section a prolonged section 10a, whose length is smaller than the width D one Sparrenfeldes 11 which can be dammed. Here a complementary prolonged section 10b cut can become and with the remainder section of the preceding roller a mounting unit 10 " assembled by the subsequent roller, which exhibits again the desired dimensions of a mineral fiber plate 10 and so 10 incorporated just like an integral mineral fiber plate can become. The prolonged gap 18 arising with it becomes 12 clean closed by pressing between the roof rafters.

After filling out all Sparrenfelder 11 with mineral fiber plates 10 a total surface application of a vapor barrier from polyethylene film can take place, whereby the single, for example crosswise over the Sparrenfelder 11 longitudinal and at the inner surfaces 12a of the rafters 12 fixed webs with self adhesive foil within the joint range sealed to become to be able.

In this way succeed in thus working on the basis of a mineral fiber web 1 of a corresponding consistency supplied in roll

form practical complete blend-free independent of whether it concerns around a new building with very regular rafter distances or an old building with very different rafter distances. The auxiliary expenditure with an old building is only raised measuring work, wastes does not arise however also there not. Few per Sparrenfeld 11 required mineral fiber plates 10 can become by some few free hand cuts along the marking lines 5 generated and with a handle also by a single person comfortable between the rafters 11 inserted, where they hold by clamping action, so that the labor despite the creation exact appropriate mineral fiber plates 10 also with strong different rafter distances is extremely small. Manufacturer-laterally the mineral fiber courses 1 with existing production plants and rolling up machines can be produced, whereby only a simple additional device is necessary in form of a roller for the production of the marking lines 5. Since with only one Rollenbreite can be worked, production and storekeeping become substantially simpler; likewise the purchaser before the purchase of the barrier does not need to make measurements of all rafter distances, in order to make a list of the required amounts of the mineral fiber material in the required web widths, but it can the total area which can be dammed the corresponding required number of among themselves same rollers acquire and can be safer to be able to dam thereby the roof framing of the indicated surface which can be dammed blend-free and simple.